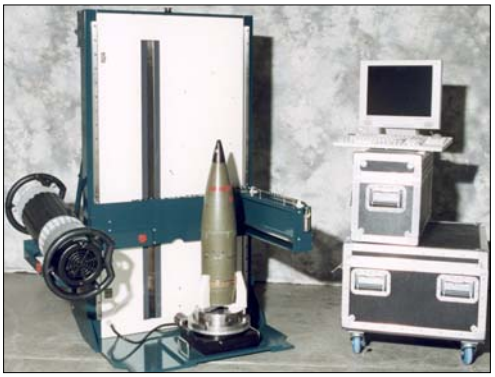
Munitions and Chemical Agent Container Inspection

The US Army Product Manager for Nonstockpile Chemical Material (PMNSCM) is responsible for the destruction of chemical agents and weapons in the United States. In support of this effort, the INEEL has developed, delivered, and deployed Digital Radiography and Computed Tomography (DRCT) systems for inspecting munitions. These x-ray systems are used to determine the liquid level, the status of the fuzing and firing train, and container integrity in single chemical rounds . Larger systems inspect drums filled with munitions or other large objects. This information is used to make decisions on safe handling and storage of chemical agents and weapons and to aid in content identification. DRCT systems enable the operator to review images in near real-time, allowing immediate decisions on disposition.

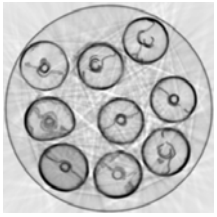


Single Munitions Scanner(SMS)

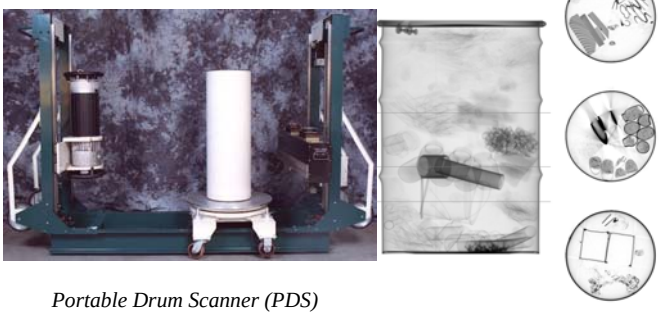
Radiograph of a 155mm water-filled munition.

2D tomographic vertical slice of a 155mm fuze.

Large Container Scanner(LCS)



Radiograph (above right) and tomographic slice (left) of a 208-l drum filled with munitions. Radiograph of a drum within a drum (upper right).



Portable Drum Scanner (PDS)

Radiograph (above) and three tomographic slices (right) of a debris-filled 208-I drum. The horizontal lines on the radiograph represent the vertical positions at which the CT slices were acquired.

DRCT Model Specific Components

- SMS: 2-wheel dolly with onboard electronics, 300kVp x-ray generator, 1024-element detector
- LCS: Cart-based, 450kVp x-ray generator, 1024-element detector (1m)
- PDS: detachable base, source and detector towers, 300kVp x-ray generator, electronics cart

DRCT System Features

- Vertically scanning x-ray source and detector
- 12-bit or higher linear diode detector arrays
- Translate/Rotate motions for data acquisition
- Setup in less than 30 minutes.
- 2-D x-ray in 3 minutes.
- 2-D tomographic slice in 1 minute.
- Full 3-D volume image in 10 minutes.
- Remote operation (up to 300 feet).